Helicobacter pylori (*H.pylori*)

Helicobacter pylori (H.pylori) is a gram-negative, spiral-shaped bacterium that impacts nearly 50% of the global population, particularly in developing nations. It is recognized as the primary contributor to chronic or atrophic gastritis, peptic ulcers, gastric lymphoma, and gastric carcinoma; however, these complications are less frequently observed in children and adolescents than in adults. The infection is typically contracted during early childhood and tends to persist if left untreated.[1,2]

There are four key factors that contribute to the development of clinical conditions such as gastritis and ulcers in the context of H. pylori infection.[3,4] Firstly, the urease activity of H. pylori is crucial for neutralizing the acidic conditions present in the stomach. Secondly, the motility of H. pylori, facilitated by its flagella, enables the bacterium to navigate towards the gastric epithelial cells of the host. This is succeeded by the interaction of bacterial adhesins with host cell receptors,[5] which is essential for effective colonization and the establishment of a persistent infection. Lastly, H. pylori releases various effector proteins and toxins, including cytotoxin-associated gene A (Cag A) and vacuolating cytotoxin A (VacA), which contribute to damage in host tissues.[6] In H. pylori gastritis, both acute and chronic inflammation is observed, characterized by the activation of eosinophils, neutrophils, mast cells, and dendritic cells.[7] Additionally, the gastric epithelial layer produces chemokines to trigger innate immune responses and activate neutrophils, which further exacerbate tissue damage, ultimately leading to the onset of gastritis and ulcers.

References

1. Ceylan A, Kirimi E, Tuncer O, Türkdoğan K, Ariyuca S, Ceylan N. Prevalence of Helicobacter pylori in children and their family members in a district in Turkey. J Health Popul Nutr. 2007 Dec;25(4):422-7.
2. Hooi JKY, Lai WY, Ng WK, Suen MMY, Underwood FE, Tanyingoh D, Malfertheiner P, Graham DY, Wong VWS, Wu JCY, Chan FKL, Sung JJY, Kaplan GG, Ng SC. Global Prevalence of Helicobacter pylori Infection: Systematic Review and Meta-Analysis. Gastroenterology. 2017 Aug;153(2):420-429.
3. Graham DY, Adam E, Reddy GT, Agarwal JP, Agarwal R, Evans DJ, Malaty HM, Evans DG. Seroepidemiology of Helicobacter pylori infection in India. Comparison of developing and developed countries. Dig Dis Sci. 1991 Aug;36(8):1084-8.
4. Jones NL, Koletzko S, Goodman K, Bontems P, Cadranel S, Casswall T, Czinn S, Gold BD, Guarner J, Elitsur Y, Homan M, Kalach N, Kori M, Madrazo A, Megraud F, Papadopoulou A,

Rowland M., ESPGHAN, NASPGHAN. Joint ESPGHAN/NASPGHAN Guidelines for the Management of Helicobacter pylori in Children and Adolescents (Update 2016). J Pediatr Gastroenterol Nutr. 2017 Jun;64(6):991-1003.

5. Zeng M, Mao XH, Li JX, Tong WD, Wang B, Zhang YJ, Guo G, Zhao ZJ, Li L, Wu DL, Lu DS, Tan ZM, Liang HY, Wu C, Li DH, Luo P, Zeng H, Zhang WJ, Zhang JY, Guo BT, Zhu FC, Zou QM. Efficacy, safety, and immunogenicity of an oral recombinant Helicobacter pylori vaccine in children in China: a randomised, double-blind, placebo-controlled, phase 3 trial. Lancet. 2015 Oct 10;386(10002):1457-64.
6. Kao CY, Sheu BS, Wu JJ. Helicobacter pylori infection: An overview of bacterial virulence factors and pathogenesis. Biomed J. 2016 Feb;39(1):14-23.
7. Diaconu S, Predescu A, Moldoveanu A, Pop CS, Fierbinţeanu - Braticevici C. Helicobacter pylori infection: old and new. J Med Life. 2017 Apr-Jun;10(2):112-117.